



# Z00607

## Standard

## 0.8 A Triacs

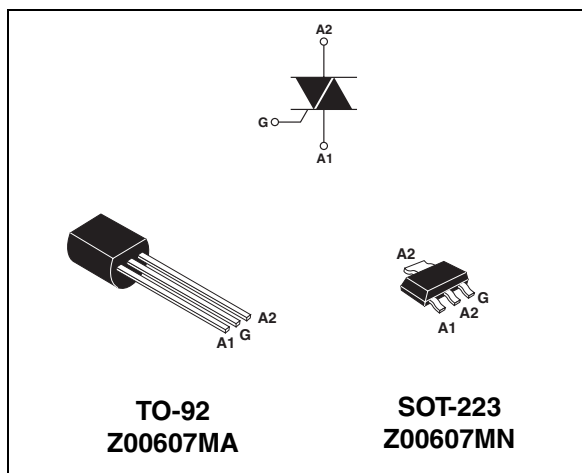
### Main Features

| Symbol            | Value | Unit |
|-------------------|-------|------|
| $I_{T(RMS)}$      | 0.8   | A    |
| $V_{DRM}/V_{RRM}$ | 600   | V    |
| $I_{GT}(Q_1)$     | 5     | mA   |

### Description

The Z00607 is suitable for low power AC switching applications. Typical applications include home appliances (electrovalve, pump, door lock, small lamp control), fan speed controllers,...

Thanks to the low gate triggering current these triacs can be driven directly by microcontrollers.



### Order Codes

| Part Number   | Marking |
|---------------|---------|
| Z00607MA 1BA2 | Z0607MA |
| Z00607MA 2BL2 | Z0607MA |
| Z00607MA 5BL2 | Z0607MA |
| Z00607MN 5AA4 | Z6M     |

**Table 1. Absolute maximum ratings**

| Symbol             | Parameter                                                                                |                      |                         | Value                          | Unit        |
|--------------------|------------------------------------------------------------------------------------------|----------------------|-------------------------|--------------------------------|-------------|
| $I_{T(RMS)}$       | RMS on-state current (full sine wave)                                                    | SOT-223              | $T_{tab} = 85^{\circ}C$ | 0.8                            | A           |
|                    |                                                                                          | TO-92                | $T_L = 50^{\circ}C$     |                                |             |
| $I_{TSM}$          | Non repetitive surge peak on-state current (full cycle, $T_j$ initial = $25^{\circ}C$ )  | F = 50 Hz            | t = 20 ms               | 9                              | A           |
|                    |                                                                                          | F = 60 Hz            | t = 16.7 ms             | 9.5                            |             |
| $I^2t$             | $I^2t$ Value for fusing                                                                  | $t_p = 10$ ms        |                         | 0.45                           | $A^2s$      |
| di/dt              | Critical rate of rise of on-state current<br>$I_G = 2 \times I_{GT}$ , $t_r \leq 100$ ns | F = 120 Hz           | $T_j = 110^{\circ}C$    | 20                             | A/ $\mu s$  |
| $I_{GM}$           | Peak gate current                                                                        | $t_p = 20$ $\mu s$   | $T_j = 110^{\circ}C$    | 1                              | A           |
| $P_{G(AV)}$        | Average gate power dissipation                                                           | $T_j = 110^{\circ}C$ |                         | 0.1                            | W           |
| $T_{stg}$<br>$T_j$ | Storage junction temperature range<br>Operating junction temperature range               |                      |                         | - 40 to + 150<br>- 40 to + 110 | $^{\circ}C$ |

# 1 Characteristics

**Table 2. Electrical characteristics** ( $T_j = 25^\circ \text{C}$ , unless otherwise specified)

| Symbol            | Test Conditions                                                        | Quadrant     |     | Value | Unit             |
|-------------------|------------------------------------------------------------------------|--------------|-----|-------|------------------|
| $I_{GT}^{(1)}$    | $V_D = 12 \text{ V}$ $R_L = 30 \Omega$                                 | I - II - III | MAX | 5     | mA               |
|                   |                                                                        | IV           |     | 7     |                  |
| $V_{GT}$          |                                                                        | ALL          | MAX | 1.3   | V                |
| $V_{GD}$          | $V_D = V_{DRM}$ $R_L = 3.3 \text{ k}\Omega$ $T_j = 110^\circ \text{C}$ | ALL          | MIN | 0.2   | V                |
| $I_H^{(2)}$       | $I_T = 200 \text{ mA}$                                                 |              | MX. | 5     | mA               |
| $I_L$             | $I_G = 1.2 I_{GT}$                                                     | I - III - IV | MAX | 10    | mA               |
|                   |                                                                        | II           |     | 20    |                  |
| $dV/dt^{(2)}$     | $V_D = 67\% V_{DRM}$ gate open $T_j = 110^\circ \text{C}$              |              | MIN | 10    | V/ $\mu\text{s}$ |
| $(dV/dt)_c^{(2)}$ | $(dV/dt)_c = 0.35 \text{ A/ms}$ $T_j = 110^\circ \text{C}$             |              | MIN | 1.5   | V/ $\mu\text{s}$ |

1. minimum  $I_{GT}$  is guaranteed at 5% of  $I_{GT}$  max.

2. for both polarities of A2 referenced to A1.

**Table 3. Static characteristics**

| Symbol                 | Test Conditions                                  |                            |      | Value | Unit          |
|------------------------|--------------------------------------------------|----------------------------|------|-------|---------------|
| $V_{TM}^{(1)}$         | $I_{TM} = 1.1 \text{ A}$ $t_p = 380 \mu\text{s}$ | $T_j = 25^\circ \text{C}$  | MAX. | 1.5   | V             |
| $V_{to}^{(1)}$         | Threshold voltage                                | $T_j = 110^\circ \text{C}$ | MAX. | 0.95  | V             |
| $R_d^{(1)}$            | Dynamic resistance                               | $T_j = 110^\circ \text{C}$ | MAX. | 420   | m $\Omega$    |
| $I_{DRM}$<br>$I_{RRM}$ | $V_{DRM} = V_{RRM} = 600 \text{ V}$              | $T_j = 25^\circ \text{C}$  | MAX. | 5     | $\mu\text{A}$ |
|                        |                                                  | $T_j = 110^\circ \text{C}$ |      | 0.1   | mA            |

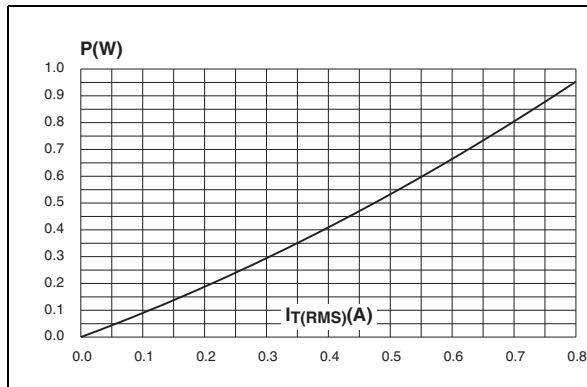
1. for both polarities of A2 referenced to A1.

**Table 4. Thermal resistances**

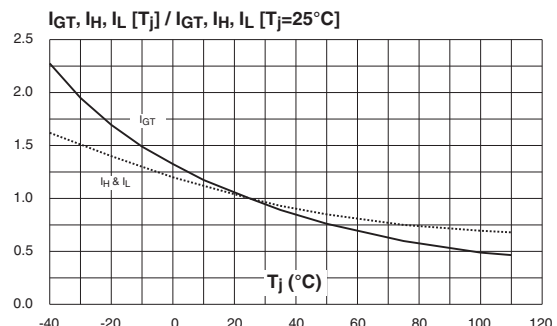
| Symbol        | Parameter             |                                    | Value | Unit                |
|---------------|-----------------------|------------------------------------|-------|---------------------|
| $R_{th(j-t)}$ | Junction to tab (AC)  | SOT-223                            | 25    | $^\circ \text{C/W}$ |
| $R_{th(j-l)}$ | Junction to lead (AC) | TO-92                              | 60    |                     |
| $R_{th(j-a)}$ | Junction to ambient   | $S^{(1)} = 5 \text{ cm}^2$ SOT-223 | 60    | $^\circ \text{C/W}$ |
|               |                       | TO-92                              | 150   |                     |

1. S = Copper surface under tab.

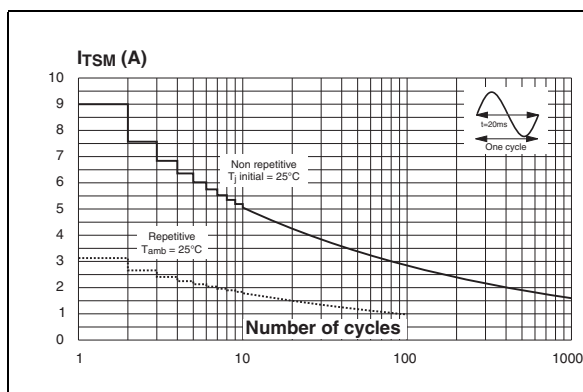
**Figure 1. Maximum power dissipation versus RMS on-state current (full cycle)**



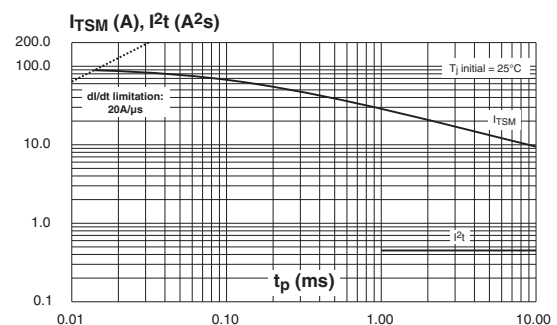
**Figure 2. Relative variation of gate trigger current, holding current and latching current versus junction temperature (typical values)**



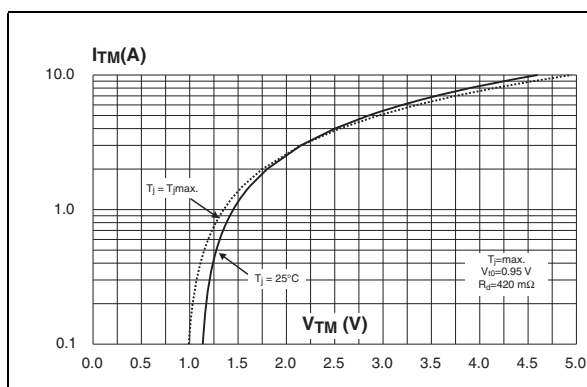
**Figure 3. Surge peak on-state current versus number of cycles**



**Figure 4. Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10$  ms and corresponding value of  $I^2t$**



**Figure 5. On-state characteristics (maximum values)**



**Figure 6. Relative variation of critical rate of decrease of main current versus  $(dV/dt)_c$  (typical values)**

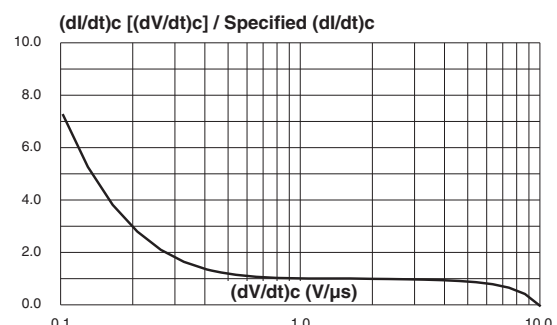


Figure 7. Relative variation of critical rate of decrease of main current versus junction temperature

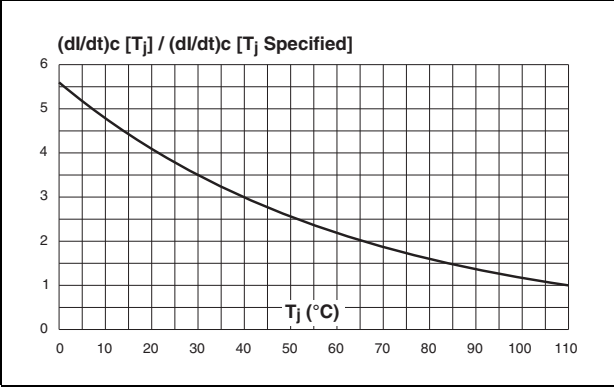
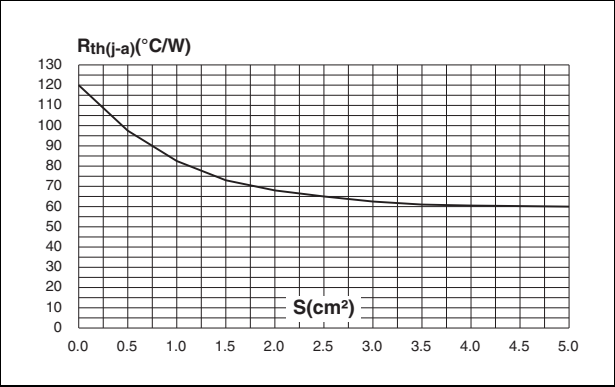
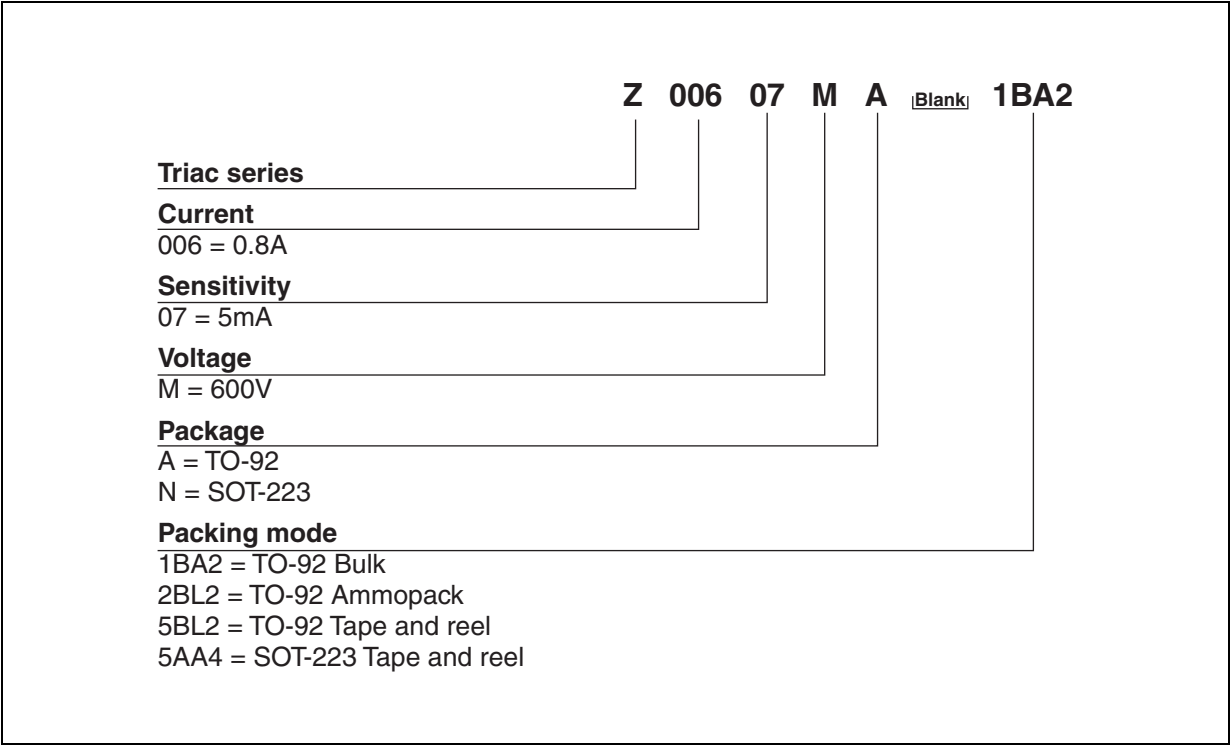


Figure 8. SOT-223 Thermal resistance junction to ambient versus copper surface under tab (printed circuit board FR4, copper thickness: 35  $\mu\text{m}$ )



2 Ordering information scheme



# 3 Packaging information

Table 5. SOT-223 Dimensions

| Ref.             | Dimensions  |      |      |        |       |       |
|------------------|-------------|------|------|--------|-------|-------|
|                  | Millimeters |      |      | Inches |       |       |
|                  | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A                |             |      | 1.80 |        |       | 0.071 |
| A1               |             | 0.02 | 0.10 |        | 0.001 | 0.004 |
| B                | 0.60        | 0.70 | 0.85 | 0.024  | 0.027 | 0.033 |
| B1               | 2.90        | 3.00 | 3.15 | 0.114  | 0.118 | 0.124 |
| c                | 0.24        | 0.26 | 0.35 | 0.009  | 0.010 | 0.014 |
| D <sup>(1)</sup> | 6.30        | 6.50 | 6.70 | 0.248  | 0.256 | 0.264 |
| e                |             | 2.3  |      |        | 0.090 |       |
| e1               |             | 4.6  |      |        | 0.181 |       |
| E <sup>(1)</sup> | 3.30        | 3.50 | 3.70 | 0.130  | 0.138 | 0.146 |
| H                | 6.70        | 7.00 | 7.30 | 0.264  | 0.276 | 0.287 |
| V                | 10° max     |      |      |        |       |       |

1. Do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15mm (0.006inches)

Figure 9. Footprint (dimensions in mm)

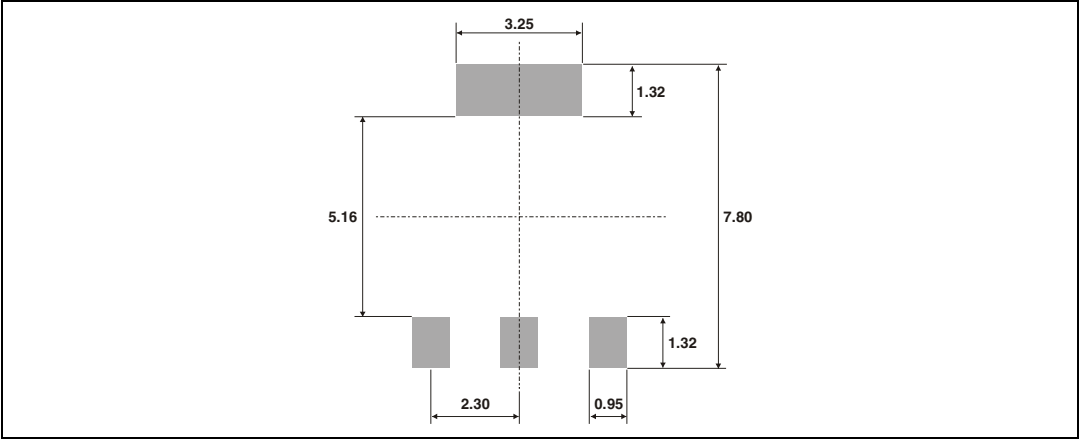


Table 6. TO-92 Dimensions

| REF. | DIMENSIONS  |      |      |        |       |       |
|------|-------------|------|------|--------|-------|-------|
|      | Millimeters |      |      | Inches |       |       |
|      | Min.        | Typ. | Max. | Min.   | Typ.  | Max.  |
| A    |             | 1.35 |      |        | 0.053 |       |
| B    |             |      | 4.70 |        |       | 0.185 |
| C    |             | 2.54 |      |        | 0.100 |       |
| D    | 4.40        |      |      | 0.173  |       |       |
| E    | 12.70       |      |      | 0.500  |       |       |
| F    |             |      | 3.70 |        |       | 0.146 |
| a    |             |      | 0.50 |        |       | 0.019 |

## 4 Ordering information

| Ordering type | Marking | Package | Weight | Base quantity | Delivery mode |
|---------------|---------|---------|--------|---------------|---------------|
| Z00607MA 1BA2 | Z0607MA | TO-92   | 0.2 g  | 2500          | Bulk          |
| Z00607MA 2BL2 | Z0607MA |         |        | 2000          | Ammopack      |
| Z00607MA 5BL2 | Z0607MA |         |        | 2000          | Tape and reel |
| Z00607MN 5AA4 | Z6M     | SOT-223 | 0.12 g | 1000          | Tape and reel |

## 5 Revision history

| Date        | Revision | Description of Changes                                                                                          |
|-------------|----------|-----------------------------------------------------------------------------------------------------------------|
| Oct-2001    | 4        | Last update.                                                                                                    |
| 25-Mar-2005 | 5        | Package: TO-92 tape and reel delivery mode 5BL2 added.                                                          |
| 21-Jun-2005 | 6        | Markings updated from Z006xxxx to Z06xxxx                                                                       |
| 13-Sep-2005 | 7        | Z00607MA 2BL2: marking corrected from 00607mA to Z0607MA                                                        |
| 12-Apr-2007 | 8        | Reformatted to current standard. Added SOT-223 package. Changed Tj from +125 to +110 in <a href="#">Table 1</a> |

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